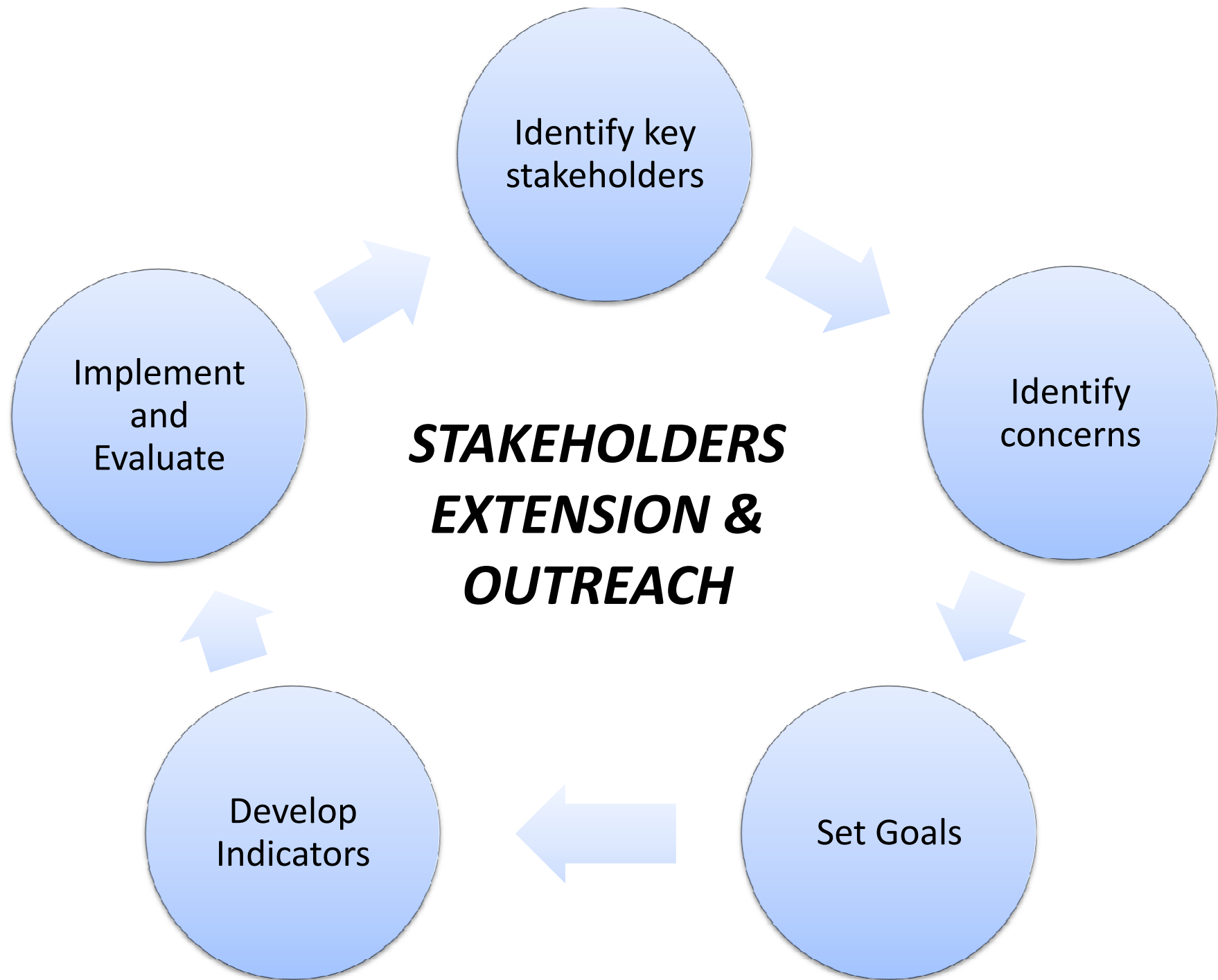


A Stream Runs Through It: Parkerson Mill Creek's Journey



Eve Brantley, AL Cooperative Extension System, Dept Crop, Soil and Environmental Sciences
Katie Dylewski, AL Cooperative Extension System, Watershed Program Specialist
Kaye Jernigan, AU Dept of Crop, Soil and Environmental Sciences





Need

1. Opportunity to improve local resource

Quality of life

Community amenity

Outdoor classroom

2. Regulatory requirement

E. coli Total Maximum Daily Load

Phase II stormwater rules

Parkerson Mill Creek

2008 and 2010 Alabama Department of Environmental Management (ADEM) Impaired Streams List, 303(d) List

Cause - pathogens

Source - urban runoff, storm sewers



Total Maximum Daily Load (TMDL)



TMDL = Point Source + Nonpoint source + Margin of Safety

Federal Clean Water Act requires TMDL be developed for streams on 303(d) impaired stream list

Maximum amount of a pollutant that a body of water can receive while still meeting water quality standards

PMC Watershed Plan Grant

Funding from the non-regulatory outreach section of ADEM

Grant awarded to Auburn University Water Resources Center
(1 of 5 projects – supporting Center of Watershed Excellence)

Project Contact: Alabama Cooperative Extension System

Awarded December 2009

Completed December 2010

Implementation 2011

Completion 2014



Watershed Overview

Urban, 9.2 sq mi watershed

Perennial (flows year round)

Other local watersheds:
Saugahatchee, Chewacla,
Moore's Mill

Lower Tallapoosa Basin



Watershed Planning & Implementation

1. Build Partnerships

Auburn University

City of Auburn

Lee County

Alabama Water Watch

Save Our Saugahatchee

Saugahatchee Watershed Management Plant

Alabama Clean Water Partnership

Girl Scouts of America

Private consultants, industry

Campus Involvement

Animal Sciences

Biosystems Engineering

Crop, Soil and Environmental Sciences

AU Landscape Architecture

Facilities Management

Athletics

College of Agriculture

Engineers Without Borders

IMPACT student service

Office of Sustainability

Alabama Invasive Plant Council

ROTC



Community Involvement

Home Schools

Girl Scouts

Save Our Saugahatchee

ChewUp

Alabama Water Watch



Watershed Planning & Implementation

2. Characterize the Watershed

What data do we have?

What do we need?

What is the problem?

(cause and source of pollution)

State Agency Monitoring

					Randolph		
AL03150110-0102-700	Pepperell Branch	R	H	Tallapoosa	Lee	Fish & Wildlife	Pathogens
AL03150110-0301-300	Parkerson Mill Creek	R	L	Tallapoosa	Lee	Fish & Wildlife	Pathogens
AL03150110-0202-300	Moore's Mill Creek	R	L	Tallapoosa	Lee	Swimming Fish & Wildlife	Siltation (habitat alteration)


Source

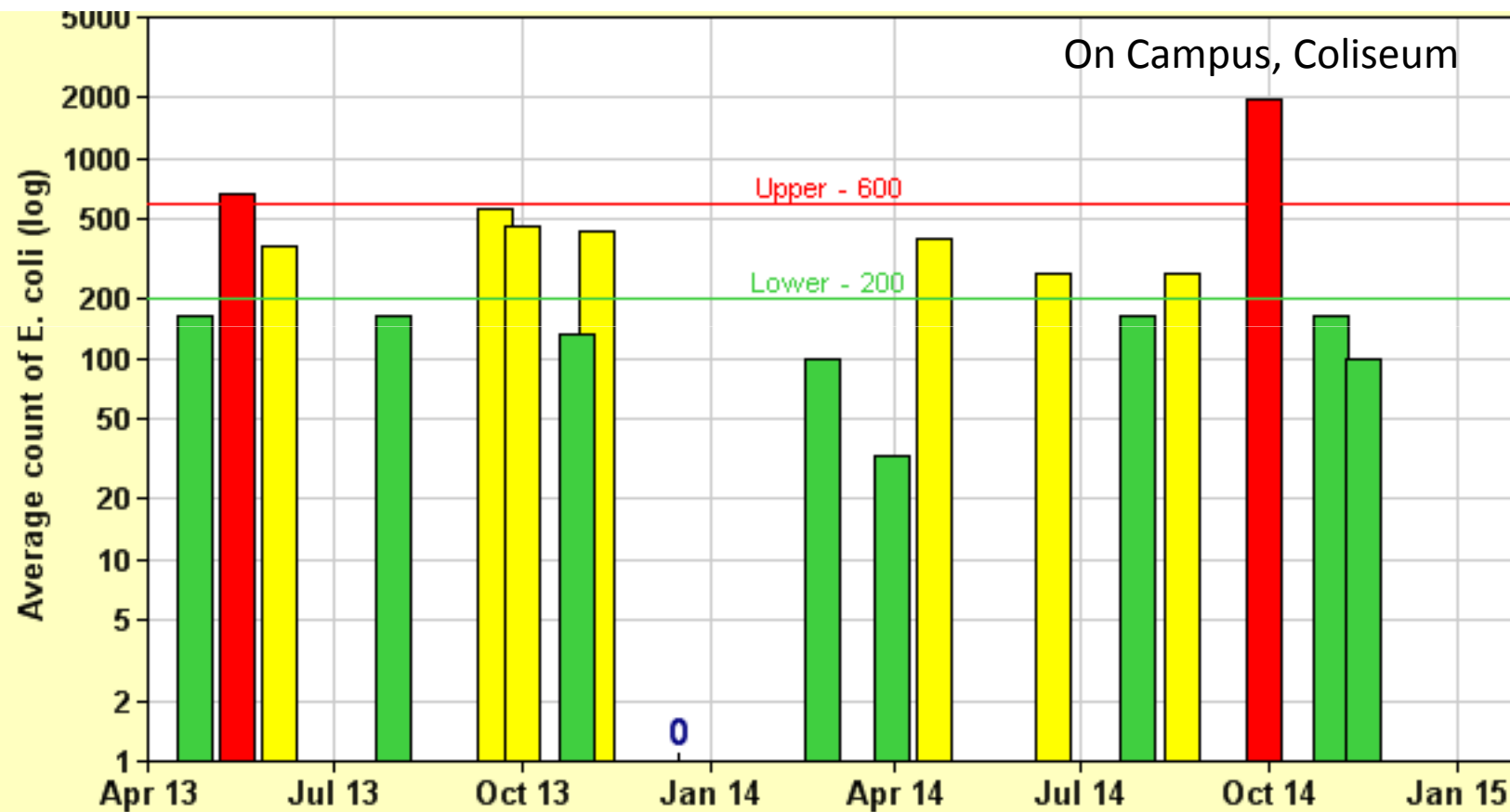


			AL-GA state line	
Urban runoff/storm sewers	2004-2009	6.67 miles	Southern Creek / Its source	2012
Urban runoff/storm sewers	2007	6.85 miles	Chewacla Creek / Its source	2012
Land development	1998	10.51 miles	Chewacla Creek / Its source	2012

Alabama Water Watch Bacteriological Monitoring



		Number of <i>E. coli</i> per 100 mL
STOP!		>600 relatively unsafe for human contact
CAUTION!		200-600 increasing risk for human illness
GO!		<200 relatively safe for human contact



E. coli for AWW Site: 07021009 in Lee County
Parkerson Mill Creek, located in the Tallapoosa watershed, No. of Samples: 19
Latitude: 32.599145 N, Longitude: -85.492909 W Hydrologic Unit Code (HUC11): 031501100301

What could be contributing E. coli to PMC?

Old infrastructure

Pet waste

Illegal dumping aka RVs

Cross connections (sewer to stormwater)

Wildlife

Unknown ... pipes and their bacteria

Are pathogens the only concern?



Watershed Planning & Implementation

3. Finalize Goals & Identify Solutions

Set goals and objectives

What is success? Set targets.

Determine load reductions needed

Identify critical areas

Get to it.

Complementary Goals

Water Quality and Quantity Functions of Natural Features

To protect and enhance streams, floodplains and wetlands in order to prevent flooding and mitigate for erosion and sedimentation.

Coordinated Development

To coordinate planning and development of communities, specifically City of Auburn and Auburn University, in order to promote and achieve environmental and economic benefits.

Open Land and Agricultural Lands

To protect and preserve these landscapes and functions of these lands.

Complementary Goals

Recreation

To establish and maintain existing trails and access to Parkerson Mill Creek and its tributaries where desired and feasible.

Education

To continue to promote the education of stakeholders on using practices and workshops within the Parkerson Mill Creek Watershed and to use Parkerson Mill Creek as an outdoor classroom.



Watershed Planning & Implementation

4. Design an Implementation Plan

Develop schedule

How will you evaluate your progress?

Who is responsible?

Concern	Potential Causes	Assessment Ideas	Watershed Goals	Measured Progress
Illicit Discharge	Incorrect Installation	Smoke/Dye Testing	Cross Connections Eliminated	Construction of projects
Illegal Dumping	RV's		Provide dump stations	
			Maps of dump stations	
			Storm Drain Marking	
Urban Runoff	Urbanization/ More Asphalt		Rainwater collection downtown	
			Education	
Sediment	Excess Runoff	Channel Erosion	Reduce Impervious Surfaces	Measure stream flow volumes and patterns



Watershed Planning & Implementation

5. Implement Watershed Plan

Implement management strategies

Monitor

Conduct Extension / Outreach



STEP-L Model

BMP	Lat/Long	N lb/yr	P lb/yr	BOD lb/yr	SED t/yr
PSRC rain gardens	32°35'19.17"N, 85°29'20.15"W	4.2	0.7	0	0.2
Raptor Center cistern	32°35'53.47"N, 85°30'43.76"W	4.2	0.7	0	0.2
Raptor Center rain garden	32°35'53.47"N, 85°30'43.76"W	8.6	0.9	0	0.2
Raptor Center vegetated swale	32°35'53.47"N, 85°30'43.76"W	9.1	1	0	0.4
Dudley Hall rain garden	32°35'56.74"N, 85°29'8.35"W	27.5	3.4	0	0.9
Dudley Hall cistern	32°35'56.74"N, 85°29'8.35"W	4.3	0.7	0.4	0.2
AU Turf rain garden	32°34'42.13"N, 85°30'0.55"W	12.7	1.5	0	0.5
AU IM stream enhancement	32°35'48.45"N, 85°29'45.44"W	13.6	5.2	27.2	10
City softball stream project	32°33'21.38"N, 85°30'43.48"W	18.9	7.3	37.8	13.9
AU Wellness Kitchen stream	32°35'56.92"N, 85°29'28.01"W	52.9	20.4	105.8	38.9
AU Corley bioretention	32°35'59.03"N, 85°29'4.08"W	18.9	2.5	0	0.6
City parking lot bioretention	32°36'25.70"N, 85°28'48.70"W	27.5	3.4	0	0.9
Pet Waste Stations (19)	various locations	0	0	0	0
Storm drain markers (350)	various locations	0	0	0	0
Campus Landscaping Renovation	various locations	20.6	3.4	118.9	1532.8
Total Reductions		223	51.1	290.1	1599.7



350 storm drain markers installed

Rain Garden – stormwater infiltration practice



Rain Garden Excavation Depths

6" Ponding Rain Garden - no soil amendments



3" Ponding Rain Garden - with soil amendments



Plant Science Research Center – 2, 100 ft² rain gardens





Dudley Hall – 400 ft² rain garden



Dudley Hall – 2,000 gallon cistern



AU Turf Research Unit – 200 ft² rain garden







19 pet waste stations
installed at 4 apartment –
condo complexes

Educational materials
provided to residents

Fines assessed for failure to
pick up waste at one of the
complexes

Wet bioswale, Lee County, Hwy 29 compactor site,
40 linear feet





S Q
E A
R N
W



Slide courtesy of Katie Dylewski, ACES

October 2013



December 2013, 3 rock vanes, 150 lf stream enhancement



January 2014





December 2013



April 2014

February 2014



February 2014



April 2014, City of Auburn Softball Complex
75 lf toe wood
Boulder vanes
150 lf stream enhancement





April 2014



April 2014



April 2014

North State
ENVIRONMENTAL



April 2014



April 2014



April 2014



April 2014

August 2014



AU Biosystems Corley Courtyard, 2 bioretention cells
Concept design by Ryan McGehee, honors students







Other projects

Deferred maintenance opportunities:

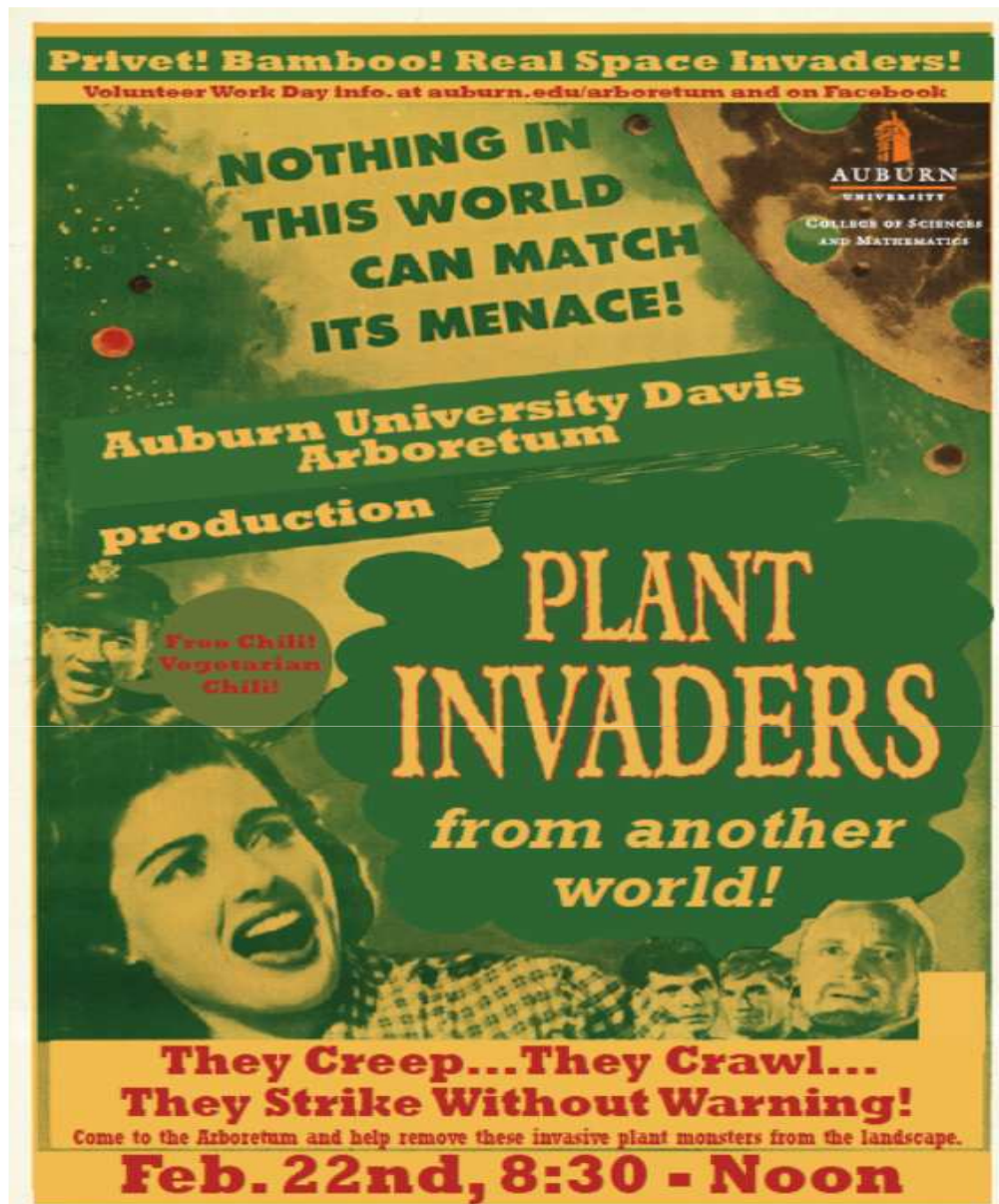
- Clearing of invasive species

Volunteer efforts:

- AL Invasive Plant Council 'Showdown'

Wellness Kitchen Stream Restoration

- Athletics and Facilities investment











Watershed Planning & Implementation

6. Evaluate and Adapt

What is working?

What sort of results are you getting?

Report to stakeholders

Update Plan

Outcomes

Improved water and habitat quality

Continued partnerships

Avoid regulatory limitations

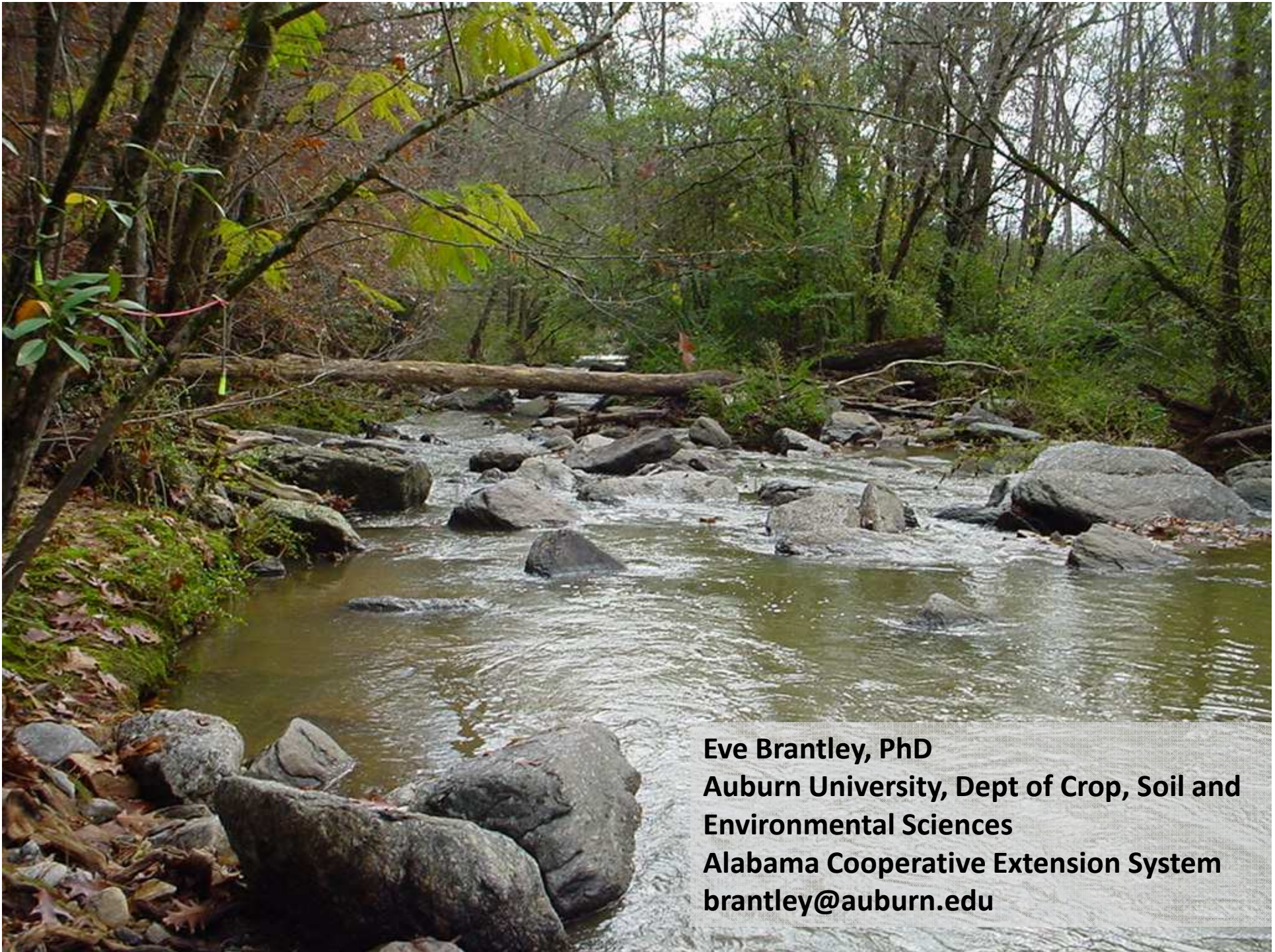
PMC is “Amenity” as described in the master plan

Parkerson Mill Creek as an Amenity

Parkerson Mill Creek is a unique recreational and educational amenity, as well as a piece of infrastructure. The section of Parkerson Mill Creek within the study area provides opportunity for a campus amenity that serves as a linear park and stream restoration system that incorporates alternative transportation routes, stormwater management facilities, outdoor learning spaces, and living laboratories. Parkerson Mill Creek should be enhanced as a continuous landscape armature throughout the campus.







Eve Brantley, PhD
Auburn University, Dept of Crop, Soil and
Environmental Sciences
Alabama Cooperative Extension System
brantley@auburn.edu